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Connecting device.

The present invention relates to a connecting device for connecting discharge devices to packages with liquid products, preferably foodstuff products, for discharging said products from the packages, wherein the packages have
5 walls of synthetic material. The connecting device includes two connecting members which can be connected to each other, namely a first connecting member which is located on a wall of the package and a second connecting member which can be connected to said first connecting member
10 for connecting the discharge device to the package. The first connecting member has a hole or a notch for a hole, said hole being closed by means of a closing member, and the second connecting member has a tubular member by means of which the closing member can be penetrated for opening
15 the first connecting member. The tubular member can be inserted into the hole and pressed onto edge portions of the hole such that the tubular member adheres to said edge portions and the connecting members thereby adhere close to each other. The hole in the first connecting member
20 has four, five or six corners and edge portions which extend between said corners and the tubular member of the second connecting member has a corresponding number of corners and edge portions extending therebetween.

It is known at connecting devices with connecting
25 members having holes and tubular connecting members fitting thereto, to design the holes and the tubular members with four, five or six corners. The purpose of designing the holes and the tubular members respectively, in this way is that connection of a tubular member to a hole shall
30 be possible only if the shapes thereof correspond exactly with each other.

However, it has been found that one by means of polygonal tubular members and holes can not entirely exclude misconnections since one by using force during connection
35 can deform the members in which the holes are provided

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and/or the tubular members such that one thereby obtains an acceptable fit between said members.

Thus, it is possible to closely connect cylindrical connecting members, i.e. tubular members of ordinary shape, to connecting members having holes, wherein the holes are polygonal, so that one moves the cylindrical connecting member into the hole with such a force that the edges thereof are deformed and bent inwards until the hole gets a circular shape into which the tubular member fits.

The object of the present invention is to eliminate this problem and this is arrived at by providing the initially defined connecting device with the characterizing features of primarily subsequent claim 1.

Since the first connecting member of the connecting device has holes and the second connecting member a tubular member, the edges of which are concave and arcuate and connect to each other, it is in practice impossible to deform the edges e.g. by means of cylindrical connecting members, which means that cylindrical connecting members are not connected to the connecting member with a hole. By designing the edges of the hole and the tubular member respectively, in said manner, it is further achieved that the members with holes and the tubular members will fit firmly together but still be easily releasable from each other by relative rotation.

The invention will be further described below with reference to the accompanying drawings, in which

figure 1 is a schematic side view showing a package and a connecting device according to the invention provided thereon;

figure 2 is a perspective view of a first connecting member of the connecting device according to figure 1;

figure 3 is a perspective view of a second connecting member of the connecting device of figure 1;

figure 4 illustrates with a plan view an inner shape of a hole in the first connecting member according to figure 2; and

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figure 5 is a plan view of an outer shape of a tubular member of the second connecting member according to figure 3.

The connecting devices 1 illustrated in the drawings are adapted for connection of discharge devices 2 to packages 3 with liquid products 4, e.g. foodstuff products, for discharging said products 4 from the packages 3.

The discharge devices 2 may be of different types. They may e.g. consist of or include a hose 5 or similar with a tap 6 and by opening the tap 6 the product 4 can flow out of the package 3 and out through the hose 5 by self-flow. The discharge devices 2 may in another embodiment include a pump P for pumping the product 4 out of the package 3 by generating a negative pressure therein.

The package 3 has walls 8 of synthetic material and it consists preferably completely of synthetic material. The material is preferably flexible and the package 3 may be designed as a plastic bag. The package 3 can preferably be placed in a container 7.

The connecting device 1 has two connecting members 9 and 10 which can be connected to each other, namely a first connecting member 9 which is provided on a first wall portion 8a of a wall 8 of the package 3 and a second connecting member 10 which can be connected to the first connecting member 9 for connecting the discharge device 2 to the package 3.

The first connecting member 9 has a hole 11 or a notch for a hole 11. The hole 11 is closed by means of a closing member 13. By means of a tubular member 14 of the second connecting member 10, said closing member 13 can be penetrated and then, said tubular member 14 is insertable into the hole 11 until the connecting members 9, 10 are closely attached to each other.

In the embodiment shown, the hole 11 has six corners 15, but it may alternatively have four or five corners 15. The hole 11 has edge portions 16 which extend between adjacent corners (see figure 4). In order to fit

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into such a hole 11 with six corners 15, the tubular member 14 also has six corners 17 (or four or five corners if the hole 11 has this number of holes) and edge portions 18 between these corners 17 (see figure 5).

5 The edge portions 16 of the hole 11 are inwardly directed and/or include members or portions which are directed inwards towards the centre C1 of the hole 11 relative to straight geometric lines L16 which connect adjacent corners 15 between the edge portions 16 to each other. The edge portions 18 of the tubular member 14 are in a corresponding manner directed inwards and/or include members or portions directed inwards towards the centre C2 of the tubular member 14 relative to straight geometric lines L18 which connect adjacent corners 17 between the edge portions 18 to each other.

15 In the embodiment shown, the edge portions 16 and 18 respectively, of the hole 11 and the tubular member 14 respectively, define concave arcs relative to the centre C1 and C2 respectively, of said hole 11 and said tubular member 14 respectively, and all these arcs may be uniform.

20 The inwardly directed edge portions 16, 18 may however be designed in other ways than concave arcs and they need not be uniform between all corners.

25 The first connecting member 9 may be provided in such a definite way on the package 3 that the edge portion 16 of its hole 11 get a predetermined orientation relative to the package 3.

30 In the embodiment of the connecting device 1 illustrated in figures 1-3, the first connecting member 9 is located inside the package 3. A member or portion 9a of the first connecting member 9, provided with the hole 11, is located, preferably welded to the inside of a first wall portion 8a of the wall 8. An unbroken part of said wall portion 8a define the closing member 13 closing the hole 11.

35 The first connecting member 9 illustrated in figures 1-3 further includes a spacer 19 which is provided to

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hold such wall portions of the walls 8 of the package 3, e.g. second wall portions 8b located right opposite to the wall portions 8a, at a distance from the hole 11 such that these wall portions can not be located so close to the hole 11 that they when emptying the package 3 can prevent or obstruct the product 4 from flowing to the hole 11 and out therethrough. The spacer 19 may have one or more lateral openings 20 and an end opening 21 in an inner part 22 thereof.

10 It should be mentioned that connecting members 9 of said type and their functions have been known for a long time - see e.g. US 4 603 793, figures 3 and 4.

The tubular member 14 may have an end edge 36 which is inclined relative to the geometric axial centre line of the tubular member 14. This inclined end edge 36 forms a tip or point 37 which is eccentric relative to the centre line.

The first connecting member 9 may instead of the hole 11 have notches therefor and the closing member 13 may in such an embodiment be provided to fill the space between said notches and it may be penetrated by means of the tubular member 14. In such an embodiment, the first connecting member 9 and the closing member 13 may be designed as a unit or the closing member 13 may be attached to the first connecting member 9 and cover the notch.

The invention is not limited to the embodiments described above and shown in the drawings, but may vary within the scope of the following claims. It should e.g. be mentioned that the package 3 may contain other liquid or semi-liquid products than foodstuff, such as e.g. pharmaceutical products or glue products.